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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,093	05/12/2006	Koichi Sato	03500.103120.1	8934

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EXAMINER	
BELYAEV, YANA	
ART UNIT	PAPER NUMBER
1791	

MAIL DATE	DELIVERY MODE
10/01/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/579,093	SATO ET AL.	
	Examiner	Art Unit	
	YANA BELYAEV	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 June 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6,8 and 15-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4, 6, 8 and 15-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-4, 6, 8 and 15-17 are pending. Claims 5, 7, 9, and 10-14 have been cancelled.

Response to Arguments

1. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-4, 6, 8 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP Patent No. 1,243,624 (Kabushiki hereinafter), in view of US Patent Application Publication 2003/0122889 (Okuda hereinafter), and further in view of Japanese Patent Publication No. 2003-345828 (Sato hereinafter).

US Patent Application Publication No. 2006/0281870 served as an English language translation for Japanese Patent Publication No. 2003-345828. All citations to Sato refer to the US Patent Application Publication No. 2006/0281870.

Regarding claims 1 and 2, Kabushiki discloses preparing a stimuli-responsive composition which contains a polymer and solvent, where the solvent is water (paragraph 4). The polymer is disclosed as a block polymer, which changes its properties by stimulation (paragraph 6). Kabushiki further discloses ejecting the liquid composition to apply the liquid composition to a recording medium (paragraph 9).

While Kabushiki discloses that the block polymer has a polyoxyalkylene repeating unit structure (paragraph 31), he does not disclose that the block polymer has a polyalkenyl ether repeating unit structure. Kabushiki further does not explicitly state that the aforementioned process produces a three-dimensional pattern.

However, in a similar field of endeavor, Sato discloses a block polymer compound useful as various kinds of functional materials (paragraph 1), which is preferably comprised of repeating units of either polyalkenyl ether, not polyoxyalkylene (paragraph 14).

Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to have substituted polyoxyalkylene, which is disclosed by Kabushiki, for polyalkenyl ether since Sato states that a block copolymer containing a repeating unit of polyalkenyl ether is preferable, while polyoxyalkylene is not preferable (paragraph 14).

Furthermore, in a similar field of endeavor, Okuda discloses ejecting droplets to thereby record characters or graphics on a recording medium or to form a fine pattern on a substrate (paragraph 3). He further discloses that it has been attempted to utilize the droplet ejecting

apparatus for industrial use, such as to create a three-dimensional object by laminating droplets of UV-curing resin or the like on a substrate and curing the droplets of the resin (paragraph 7), wherein the UV-curing is interpreted by the examiner as imparting a stimulus to the applied liquid composition and solidifying the liquid composition after the modification of the block copolymer.

Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to have used the liquid composition, which is disclosed by Kabushiki in view of Sato, to produce a three-dimensional pattern, since it was known to create a three-dimensional object, comprised of droplets on a substrate, such as a recording medium (paragraphs 3 and 7).

Regarding claim 3, Kabushiki teaches the block polymer as being amphiphillic, thereby forming micelles (paragraph 16).

Regarding claim 4, Kabushiki teaches the stimulation as temperature change, pH change, exposure to electromagnetic wave, and concentration change (paragraph 6).

Regarding claims 6 and 8, Kabushiki teaches the predetermined functional substance as a pigment, which is a coloring material (paragraph 4).

Regarding claims 16 and 17, Kabushiki in view of Sato discloses preparing liquid compositions each comprising a block polymer having a polyalkenyl ether repeating unit structure and a liquid medium, which is ejected to a recording medium. Then, imparting a stimulus to the applied liquid composition to modify the block polymer, thereby forming a pattern (see claim 1).

Kabushiki in view of Sato does not disclose ejecting a second liquid composition which differs from the first liquid composition, in that the two compositions have different colors, and applying the liquid composition onto the pattern.

Okuda, however, discloses matrix-array heads corresponding to the four ink colors of yellow, magenta, cyan and black having ejectors for each color arranged in parallel on the carriage. Dots of the four colors are superimposed on the sheet of recording paper (paragraph 147).

It would have been obvious to combine the process disclosed by Kabushiki in view of Sato with the step disclosed by Okuda since it allowed for full-color images to be recorded (Okuda, paragraph 147).

4. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kabushiki in view of Okuda and Sato, and further in view of US Patent 6,233,424 (Mohri hereinafter).

The teachings of Kabushiki in view of Okuda and Sato are detailed in the rejection of claims 1-4, 6, 8 and 16-17 under 35 USC 103(a) above.

Regarding claim 15, Kabushiki in view of Okuda and Sato does not disclose that the liquid composition applied to the recording medium has a storage modulus of from 10^2 to 10^7 Pa on the recording medium and a loss modulus of from 10^2 to 10^7 Pa on the recording medium with the provision that the storage modulus is greater than or equal to the loss modulus.

However, in a similar field of endeavor, Mohri, who discloses an apparatus that uses toner having an external additive and embeds the toner in a receiving layer, states that the liquid

composition, specifically Mohri discloses a toner, has a storage modulus of from 10^2 to 10^5 Pa and a loss modulus of from 10^2 to 10^5 Pa (column 18, lines 40-45).

Mohri also discloses that ratio of the loss modulus to the storage modulus is between 0.01 to 10 (column 18, lines 65-66).

However, Mohri discloses that the storage modulus (G') indicates the elasticity of an elastic member. If the value exceeds 10^5 Pa, the elasticity is great, thus causing a state where toner cannot be embedded in the image receiving layer to be realized. As a result, a stepped portion is generated between the toner and the image receiving layer. If the value is smaller than 10^2 Pa, the restoring force is weakened (column 18, lines 47-53).

Mohri also discloses that the loss modulus (G") indicates dynamic action as a viscous material. If the value exceeds 10^5 Pa, force, such as high pressure, for melting and deforming the image receiving layer is required. If the value is smaller than 10^2 Pa, fluidity is enhanced and thus offset of the image receiving layer to the fixing member takes place (Column 18, lines 58-63).

Lastly, Mohri discloses that the loss tangent (G"/G') is considered to correspond to the stress relaxation time when the material is elastically deformed. If the value is smaller than 0.01, relaxation time is long, the restoring force is strong and the smoothness of the surface of the fixed image is unsatisfactory. If the value exceeds 10, the relaxation time is short and deformation easily takes place. However, the coagulation force is weak and a wavy crease can easily be formed (column 18, lines 65-67 through column 19, lines 1-11).

Thus the value of the storage modulus, loss modulus, and ratio of the storage modulus to the loss modulus are established as result effective variables.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have optimized the range of the storage modulus, loss modulus, and ratio of the storage modulus to the loss modulus. However, the optimization of a range or other variable within the claims that flows from the "normal desire of scientists or artisans to improve upon what is already generally known" is prima facie obvious. *In re Peterson*, 315 F.3d 1325, 1330 (Fed. Cir. 2003) (determining where in a disclosed set of percentage ranges the optimum combination of percentages lies is prima facie obvious). The discovery of an optimum value of a variable in a known process is usually obvious. *In re Aller*, 220 F.2d 454,456 (C.C.P.A. 1955).

Conclusion

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to YANA BELYAEV whose telephone number is (571)270-7662. The examiner can normally be reached on M-Th 8:30am - 6pm; F 8:30 am- 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Y. B./
Examiner, Art Unit 1791
/ Carlos Lopez/
Primary Examiner, Art Unit 1791